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Participatory Design of the World's Largest DPD Project with Children

Jessica Korte
The University of Queensland
Brisbane, Australia
j.korte@uq.edu.au

Aurora Constantin
University of Edinburgh
Edinburgh, UK
aurora.constantin@ed.ac.uk

Cara Wilson
University of Edinburgh
Edinburgh, UK
cara.wilson@ed.ac.uk

Cristina Adriana Alexandru
University of Edinburgh
Edinburgh, UK
cristina.alexandru@ed.ac.uk

Gavin Sim
University of Central Lancashire
Preston, UK
grsim@uclan.ac.uk

Janet Read
University of Central Lancashire
Preston, UK
jcread@uclan.ac.uk

Judith Good
University of Sussex
Brighton, UK
j.good@sussex.ac.uk

Jerry Fails
Boise State University
Boise, Idaho, USA
jerryfails@boisestate.edu

Eva Eriksson
Aarhus University
Aarhus, Denmark
evae@cc.au.dk

ABSTRACT

In this workshop, we invite researchers and practitioners as participants in co-designing the protocol for the world's largest Distributed Participatory Design (DPD) project with children. Participatory Design – whose inclusive benefits are broadly recognised in design – can be very challenging, especially when involving children. The current COVID-19 pandemic has given rise to further barriers to PD with such groups. Recent key barriers include social distancing and government-imposed social restrictions due to the additional health risks to vulnerable children and their families. This disrupts traditional in-person PD (which involves close socio-emotional and often physical collaboration between participants and researchers). However, alongside such barriers, we have identified opportunities for new and augmented approaches to PD across distributed geographies, backgrounds, ages and abilities. We invite the CCI community to examine Distributed Participatory Design (DPD) as a solution for overcoming these new barriers, during and after COVID-19. Together, we offer new ways to think about DPD, and unpick some of its ambiguities. This workshop builds on work conducted in a similar workshop in IDC 2020, and this year will focus on the planning and design of the protocol for the world's largest DPD project with children.

CCS CONCEPTS

• **Human-centered computing → Participatory design**.

KEYWORDS

participatory design, children, distributed, online

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1 BACKGROUND:

In light of the COVID-19 pandemic, it is clear that online PD is increasingly being adopted by PD researchers, because it enables people who are not co-located to participate in and contribute to a project (physical distribution) [4, 5, 12]. In spite of coming with its own difficulties and barriers (e.g. communication and knowledge sharing, technology requirements), we strongly believe that online PD should be encouraged, especially because it has the potential to increase inclusion across cultures, languages, and abilities.

Distributed PD can be thought of as an extension of online PD, but it can also be considered as an instance of online PD. We adopt a global perspective, suggesting that PD can become a distributed [13], and at times asynchronous, practice. We expect it to rely heavily on online tools and online presence but also acknowledge that it may be possible without any online elements.

When considering whether PD is distributed or not, it can be helpful to think about the use of the term *distributed* and to consider what this might mean. Often times *distributed* is thought of in terms of time (asynchronous) and location (geographically separated). However, we posit that a different perspective also applies in terms of two alternative aspects - first to the distribution of a PD *process* and secondly to the distribution of a design *effort*.

The PD *process* can be packaged and distributed by the researcher. In this model the researcher can gain access to children through three mediums: technology, via a teacher or facilitator acting as a mediator, or via the child's parents or guardians. The outcomes of the design session will be significantly influenced by this layer. Further work is required to understand how to effectively package material for distribution within these three mediums. For example different materials may need to be produced to be used with a

parent or guardian within a home context in comparison to a school. Parents and teachers may not understand the design space in which they are being asked to facilitate the session. This may cause anxiety or reluctance to participate, impacting both the experience of the children and the final output. Although this is not intended to be a definitive model of all permutations of how to facilitate a DPD session, it aims to invoke a critical discourse around the process of working remotely with children.

The other aspect of DPD, the distribution of *effort* towards solving a design problem, is also in need of considerable further study. A tension exists in IDC and CCI as to the ethics of the inclusion of children in design activities within the context of the value of their contribution versus the time they spend on the effort. It is not acceptable, for example, to engage with thousands of children around the world without considering what their contribution brings. This contribution might have a cultural emphasis, a needs emphasis, or an age-related emphasis, or it might be a piece of the whole - e.g. the interface look and feel, the reward mechanisms for a game, or the characters. Distributing the design effort, which is necessary as the groups of children included become larger, is a challenge for DPD that requires considerable further work.

PD is an intensive and difficult process, in which unexpected situations can arise at any stage [2]. In DPD, unexpected situations could arise with a higher probability and impact than those which occur in traditional in-person PD, as it adds more dimensions, such as geographical areas, cross-language and culture interactions, and new incidental participants. This requires extra attention, and possibly contingency planning, around issues such as:

- technology dysfunction (e.g. [10]);
- unexpected difficulties with technology installation and use;
- unexpected ethical considerations (e.g. situational or 'in-action ethics' [11]); and
- resource management (e.g. identifying the length, number and type of sessions).

Therefore, when planning and conducting DPD, researchers need to identify possible solutions and alternatives for potential unexpected situations and failures. In addition, more patience is required, and more time should be allocated for activities [6].

Further work is required to understand how this distributed process impacts the children's experience and understanding of the design process. The children may not understand their role or contribution to the overall project. In addition they may struggle with ideation, without the help of their peers or the researcher. This may result in them disengaging from the process or not understanding their true value in the design process.

DPD provides new opportunities for removing participation and inclusion barriers, access to new PD resources, and opportunities for skills development. In a forthcoming publication [1], the authors identified directions for new method development and raised methodological and practical questions to be addressed by PD researchers. We also identified three prominent future directions:

- "Designing and developing innovative DPD methods and tools. New innovative methods and tools which incorporate underutilised technologies, including machine learning (ML), should also be considered.
- Defining or shaping the roles within DPD. It is crucial to understand the roles of the designers and other participants within DPD, and to train participants, in order to reduce unexpected situations and ensure consistency.
- Developing strategies for offline and hybrid DPD. Non-technological alternatives are important in overcoming the digital divide, however, where possible, hybrid DPD strategies could offer more flexibility (e.g. more diverse forms of expression and support)." [1]. Table 1 highlights some of the preliminary considerations identified for selecting between online, offline and hybrid PD approaches.

In this workshop, we invite the CCI commmunity to 1. design and participate in the world's largest DPD project, 2. help define what characterises DPD, and 3. address the above listed future challenges.

This workshop builds on several successful workshops and a SIG at CHI2019 [2], INTERACT2019 [9], and IDC2019-2020 [3, 4] which have explored PD, DPD, and supporting children with special needs during PD/DPD. In last year's workshop [4], our aim was to design the World's Most Inclusive PD project; the outputs built a strong foundation resulting in a better understanding of the context [1]. This year, with a more mature understanding of the COVID-19 pandemic and the international situation surrounding it, we will build on the outcomes of the last workshop and focus on creating a protocol for the World's Largest PD project.

2 ORGANIZERS:

Jessica Korte is an Advanced Queensland TAS DCRC Fellow at The University of Queensland's Human-Centred Computing in Queensland, Australia. She is passionate about PD's potential to empower children. She developed a PD approach for designing with young Deaf children [7]. She continues to work with Deaf communities to design language technologies [8].

Aurora Constantin is a University Teacher and postdoctoral researcher at the University of Edinburgh School of Informatics, UK. Her research focuses on designing technology for individuals with Autism Spectrum Disorder (ASD), PD, User-Centred Design (UCD), and Action Research (AR) with various stakeholders. Currently she is working on designing a technology-based tool to support children with ASD to express their creativity during PD. She leads the CISA HCI group.

Cara Wilson is a Research Fellow in the School of Design at the University of Edinburgh. Her work seeks to understand how self-expression and other agentic concepts can be supported through participatory design approaches with diverse groups, including minimally-verbal children on the autism spectrum.

Cristina Adriana Alexandru is a Research Associate and University Teacher at the University of Edinburgh School of Informatics, UK. She specialises in UCD, development, and usability evaluation of healthcare systems and tools to cater for the needs of different healthcare practitioners. She has special interests in PD and consideration of the viewpoints of very different user groups. She is also interested in automating usability evaluation of user interfaces in healthcare.

When to choose which PD approach?				
In-person PD	**Online PD or DPD**	**Offline DPD**	**Asynchronous DPD**	**Hybrid DPD**
The great strength of face-to-face PD is designing with colocated participants.	Online PD and DPD provide access to participants and communities who cannot colocate.	Offline DPD should be examined for its potential to bridge the digital divide.	Asynchronous DPD allows for more time, supporting translation or processing of materials, and extra time for participants' self-paced work.	Hybrid DPD could support involvement of participants across the digital divide *and* harness advantages of technology-mediated PD. However, different kinds of involvement may be unequal.

Table 1: Key considerations in selecting a PD approach. Source: [1]

Judith Good is Professor of Interaction Design and Inclusion in the Department of Informatics, University of Sussex, UK. Her research interests focus on the co-design of new technologies for children, with and without disabilities. She is also interested in developing new participatory methodologies for typically marginalised populations to have greater involvement in both the design and evaluation of new technologies.

Gavin Sim is a Reader in Human Computer Interaction, he has worked at UCLan since 2002. His research interests are in the area of HCI and educational technology in particular usability / user experience evaluation methods. He is an active researcher within the ChiCI group, where his focus has been on evaluating user experience and usability within games and educational technology. He has written method papers for IDC, and has worked with the BBC.

Janet C. Read is a Professor in Child Computer Interaction and is the Director of the Child Computer Interaction (ChiCI) research group at UCLan. Internationally known for her work on designing and evaluating technologies for children as well as for her work on text input with digital ink, Prof. Read manages research grants and research students, teaches research methods and advanced HCI and contributes to SET activities in local schools. As a primary author of the textbook, 'Evaluating Interactive Products with Children', Prof. Read has worked with industries including Vision Objects, France, SAPO, Portugal and the BBC, UK in the design and evaluation of products for children. The Fun Toolkit introduced by Read is known to be used by industry.

Jerry Alan Fails is an Associate Professor in the Computer Science Department at Boise State University in Idaho, USA. He has designed technologies with and for children using PD methods for more than 15 years. His primary area of research is HCI, with a focus on technologies that empower children to search and find resources online, security and privacy for children, and engage children with one another, get them active, and encourage them to explore the world around them.

Eva Eriksson is an Associate Professor at the Department of Information Studies and Digital Design at Aarhus University, Denmark. She was one of the founders of Gothenburg working group for Interaction Design And Children (IDAC) in Sweden, and is now part of the Center for computational thinking and design in Denmark. Her research focus is interaction design in public knowledge institutions and designing children's technology specializing in PD, collaboration, and developmentally diverse children.

3 WEBSITE:

We will use the workshop website to publish the call for participation, submission instructions, and news: https://sites.google.com/view/worlds-largest-dpd-project/home

4 PRE-WORKSHOP PLANS:

Multiple recruitment approaches will be used to attract participants who have experience or interest in PD or DPD with children. First, the organizers will use professional networks to contact researchers who may be interested in participating in this workshop (including the participants to their previous IDC'19 and 20 workshops). As we have experience with PD and running workshops, we are confident we will be able to attract potential participants via word-of-mouth.

Second, several organizers have access to research and professional email lists (including University of Edinburgh's CISA HCI group, PDworld and NordiCHI, CHI, CHI-Kids, Center for Participatory IT (PIT)) which will be used to advertise the workshop and recruit participants. Third, we will also use social media channels (e.g. Twitter, Academic Facebook groups) to announce the workshop. Finally, we will create a website that will be used to attract researchers' and PD participants' attention to our workshop.

We aim to attract two types of workshop attendees: active participants, who have interest and/or experience in DPD or PD with children; and observers, who are interested in learning about these PD domains. All participants are invited to submit a position paper explaining their experiences.

5 WORKSHOP STRUCTURE:

The workshop will be presented online, in a drop-in, drop-out format to allow flexibility of attendees from all around the world. The overarching goal of the workshop is to undertake hands-on activities focused on developing the globally distributed DPD protocol. The proposed schedule for the workshop is:

- Session A (45 min): Initial introductions and discussion of experiences with DPD, online PD, multi-group PD, etc.
- Break and introductions to new attendees (15 min)
- Session B (45 min): Co-design of World's Largest DPD Project Part 1
- Networking break (30 min)
- Session C (45 min): Co-design of World's Largest DPD Project Part 2
- Break and introductions to new attendees (15 min)
- Session D (45 min): Opportunities and challenges of worldwide DPD

5.1 Session A

Session A will begin with an introduction from the Workshop organisers, setting the scene for the World's Largest DPD Project. Then there will be an introductory activity for all participants to get to know each other. We will then spend some time discussing participants' experiences with DPD, online PD, PD with multiple groups, and other experiences relevant to running the World's Largest DPD Project with Children in a world marked by the global pandemic.

5.2 Sessions B and C

Sessions B and C will be the co-design of the research protocol for the World's Largest DPD Project. The organisers will provide a template, with notes based on the results of last year's workshop [4] as a starting framework. The protocol to be developed will include:

(1) Research questions to be addressed by the World's Largest DPD Project, such as:
   - RQ1: How can the design contributions, level of participation and collaboration of children be supported to enable their successful involvement in DPD?
   - RQ2: How can technology be used to support children to communicate and collaborate while reduce potential risks (e.g. security)?
   - RQ3: What impacts do DPD and technology use have on children's skills?
   - RQ4: How can adults (e.g. parents, teachers) support children's involvement in DPD?
(2) Project goals. Based on [4], two promising goals could be a social network for children or solutions to address climate change and its impacts.
(3) Project settings.
(4) Participants, recruitment strategies, and consent.
(5) Activities to be undertaken. This may be provided as umbrella strategies, or packages of activities that should work well with children of particular ages or with particular needs and abilities.
(6) Data collection.
(7) Data analysis.
(8) Data management and sharing.
(9) Plans for return of results or findings of research to participants.
(10) Plans for dissemination and publication of project outcomes.
(11) Project closure processes.
(12) Plans for sharing and/or future use of data and/or follow-up research.

This should result in a project protocol which Workshop attendees can take, modify to fit their context and the demographics of the children they will work with, and include in submissions to their institution's ethics review board.

5.3 Session D

Session D will be discussion-based. Drawing from the opportunities and challenges of distributed, online and hybrid PD identified in [1], participants will break into groups to discuss ways of capitalising on opportunities and addressing challenges within their own contexts, and in the overarching DPD Project.

5.4 Resources

This workshop will run online. The drop-in, drop-out format has been chosen to accommodate attendees who may not be able to attend the full four hours, such as those in substantially different time zones.

6 POST-WORKSHOP PLANS:

After the workshop, a finalised protocol for the World's Largest DPD Project will be distributed to all workshop attendees who express an interest in running the project at their home institutions. These attendees will be encouraged to return with the final globally distributed PD protocol to their home institution, to apply for required ethical clearance, and to undertake PD activities according to the protocol with one or more of their local communities. All workshop attendees who conduct ethically-approved PD using the protocol and report back with design data and/or adaptation data will be invited to co-author a paper with the Workshop organisers.

7 CALL FOR PARTICIPATION:

This 4 hour, drop-in/drop-out workshop will bring together researchers and practitioners with interest and/or experience in Participatory Design (PD) or Distributed Participatory Design (DPD) with children to join us in co-designing the protocol for the World's Largest DPD Project, a globally distributed PD project. Participants will then have the opportunity to take the protocol back home, apply for ethics approval, and run (D)PD session/s within their local communities. We'll ask you to report back with any design data generated, and any reflections on adaptations to the protocol to address the needs of the children you work with. Everyone who provides data will be invited to co-author a paper on the World's Largest DPD Project.

We accept two types of participants: a) active participants, who bring their own experience of PD; and b) observers, who wish to learn more. Active participants are invited to submit a 2-page position paper via our website, explaining their interest and/or experience in PD or DPD. Position papers will be evaluated based on their relevance to the workshop theme and topics, quality of presentation and potential to encourage debate. At least one author of each accepted position paper must attend the workshop. All participants and observers must register for both the workshop and the main conference. Application submission and more information can be found online on our website (https://sites.google.com/view/worlds-largest-dpd-project/)

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